

# WATER RESOURCES

## WASTEWATER TREATMENT

### Indicator 5. Wastewater Treatment

**Background** In 1999, about 55 percent (2.2 million) of Kentucky's residents, were connected to municipal wastewater treatment systems.<sup>1</sup> Poorly operated and maintained wastewater treatment plants are the fifth leading source of pollution to monitored waterways in Kentucky. The environmental and health implications from the poor operation of these plants can be severe, impairing water quality with disease-causing bacteria, metals and nutrient-laden effluent. In addition to degrading surface water, sewage can migrate into groundwater through the limestone karst underlying almost half of Kentucky.

The number of wastewater plants continues to increase in Kentucky. In 1999, 3,608 wastewater treatment facilities were permitted to operate in the state, an increase of 16 percent since 1997. The greatest increase was in package plants, which now total 1,829. Package treatment plants are prefabricated plants of small capacity. An estimated 60 percent of the Kentucky households are connected to public sewers.

**Goal** Protect the waters of the Commonwealth by ensuring compliance with state and federal water rules, regulations, permits and enforcement actions.

**Progress** During 1999, 53 percent (1,896 plants) of the 3,608 wastewater plants permitted to operate in Kentucky had one or more violations of water quality regulations. This was improvement since 1997 when 2,048 had violations. A majority of the 44,356 violations cited in 1999 were either monitoring or reporting infractions while 26 percent (11,689 violations), were violations of permit limits set to protect public health and the environment.

Package treatment plants account for 38 percent of the wastewater permit limit violations. Poor maintenance and operation have led the state to target problem plants for removal or regionalization. Between 1995 and 1999, 275 package plants have been deactivated.

Efforts to upgrade and build new municipal wastewater treatment plants continue. Millions of dollars in federal, state, local and private funds have been invested in wastewater treatment. For example, between 1989 and 1999, 119 projects totaling \$284 million have been funded through a low-interest state wastewater revolving loan program. But an estimated \$3.2 billion is still needed over the next 20 years to meet statewide wastewater construction needs.

A state program to require industries to pretreat their wastewater prior to its discharge to a municipal wastewater treatment plant has assisted in reducing pollutants released to water-

### At a Glance

Number of households served by waste treatment plants  
..... 55%

Number of wastewater treatment plants  
1995 ..... 3,227  
1997 ..... 3,089  
1999 ..... 3,608

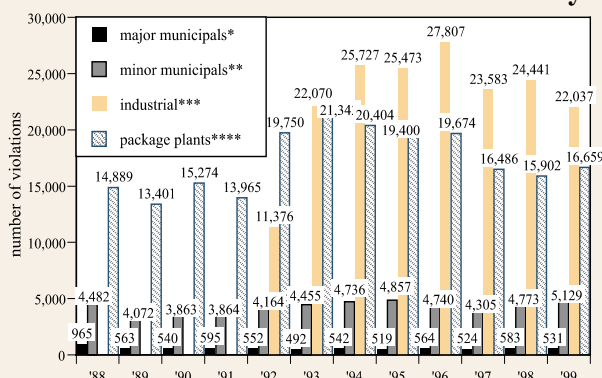
Number of violations cited at plants  
1995 ..... 50,249  
1997 ..... 44,898  
1999 ..... 44,356

Percent of wastewater treatment plants with violations  
1995 ..... 60%  
1997 ..... 66%  
1999 ..... 53%

Plants with violations (by type of plant, 1999)  
package plants. . . 833  
minor industrial. . . 807  
minor municipal . . . 157  
major municipal . . . 51  
major industrial . . . 48

Cost to meet wastewater infrastructure construction needs in next 20 years  
..... \$3.2 billion

### Measure 1. Violation Trends at Wastewater Treatment Plants in Kentucky



### Measure 2. Types of Wastewater Treatment Plants and Violations of Regulatory Requirements in Kentucky (1999)

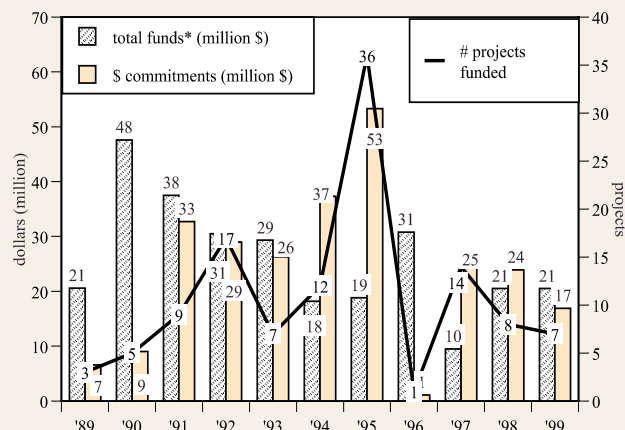
type of plant	number of plants	# of plants in violation	% plants in violation	total violations*	violations of permit limits
Major Municipal	70	51	73%	531	324
Minor Municipal	178	157	88%	5,129	2,164
Major Industrial	58	48	83%	326	234
Minor Industrial	1,473	807	55%	21,711	3,487
Package	1,829	833	46%	16,659	5,480
<b>Total</b>	<b>3,608</b>	<b>1,896</b>	<b>53%</b>	<b>44,356</b>	<b>11,689</b>

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### Measure 3. Wastewater Pretreatment Programs - Number of Industrial Users in Noncompliance in Kentucky

wastewater treatment plant	# industrial users	# in non-compliance
Ashland	5	1
Auburn	1	1
Bardstown	17	3
Beaver Dam	7	1
Bowling Green	24	5
Campbell/Kenton Co.	47	1
Campbellsville	6	1
Carrollton	2	1
Elizabethtown	21	2
Frankfort	15	2
Franklin	10	2
Fulton	3	3
Glasgow	15	2
Harrodsburg	6	3
Lawrenceburg	6	1
Lebanon	8	2
Leitchfield	11	3
Lexington	38	6
London	10	9
Louisville	121	28
Mayfield	6	3
Maysville	6	1
Monticello	3	1
Morehead	6	1
Morganfield	4	2
Mount Sterling	7	3
Owingsville	1	1
Paris	8	1
Princeton	1	1
Richmond	25	2
Russellville	6	1
Shelbyville	14	1
Somerset	29	3
Springfield	5	3
Stanford	2	1
Williamstown	4	1
Winchester	15	4
<b>Total (1999*)</b>	<b>37</b>	<b>679</b>
<b>Total (1997*)</b>	<b>39</b>	<b>543</b>
<b>Total (1996*)</b>	<b>21</b>	<b>56</b>
<b>Total (1994*)</b>	<b>19</b>	<b>52</b>
<b>Total (1992*)</b>	<b>27</b>	<b>115</b>

### Measure 4. Kentucky Wastewater Infrastructure Loan Fund



ways. Pretreatment programs are in effect at 679 industrial facilities in 65 cities. During 1999, 106 of the 679 industrial facilities (15.6 percent) were in significant noncompliance with their pretreatment requirements at sometime during the year.

Combined sewer overflows (CSOs) are a problem in older cities where stormwater runoff is carried in sanitary sewer pipes. During storms, the sewers overflow and discharge raw sewage into receiving waters. The Division of Water has identified 17 cities with CSOs and 293 CSO outfall points. Louisville has the greatest number of CSOs at 115. The elimination of CSOs can be costly and in many cases not practical. Only 15 CSOs have been eliminated since 1996. Instead, efforts are being made to control CSOs to prevent discharges.

#### Footnotes

1. *Water Resource Development: A Strategic Plan for Wastewater Treatment, Draft, Kentucky Water Resource Development Commission, April, 2000.*

#### Measures - notes and sources

**Measure 1.** \*Major municipals treat 1,000,000 gallons or more per day. \*\*Minor municipals treat less than 1,000,000 gallons per day. \*\*\*Industrial facilities treat effluent generated during manufacturing process (data not available prior to 1992). \*\*\*\*Package treatment plants are prefabricated plants of small capacity. Source: Ky. Division of Water.

**Measure 2.** \*Includes permit, monitoring and reporting violations. Source: Ky. Division of Water.

**Measure 3.** \*July-December reporting period. Significant non-compliance as defined by 40 CFR 403.8(f)(2)(vii). Source: Ky. Division of Water.

**Measure 4.** \*Includes federal grants, state match and interest incurred. In 1996, most of the money distributed went to existing projects. Source: Ky. Division of Water.